EFFECTIVENESS OF A MULTIDISCIPLINARY ANTIMICROBIAL STEWARDSHIP PROGRAM IN REDUCING THE RATE OF CARBAPENEM-RESISTANT ACINETOBACTER BAumannii IN A UNIVERSITY HOSPITAL OF TAIWAN

Ti-Ying Hsu a,b, Hsin-Pai Chen c,d, Hui-Chun Yu c,d, Yu-Ching Lin c,d, Yueh-Chun Weng c,d, Yuan-Ming Lee c,d, Chia-Wei Lin c,d, Jen-Jen Tang c,d, Yajing Li c,d, Wei-Shu Wang c,d, Su-Shun Lo e,f. aInfection Control Office, National Yang-Ming University Hospital, Yilan, Taiwan; bDepartment of Medicine, National Yang-Ming University Hospital, Yilan, Taiwan; cSchool of Medicine, National Yang-Ming University, Taipei, Taiwan; dInfection Control Office, National Yang-Ming University Hospital, Yilan, Taiwan; eDepartment of Laboratory Medicine, National Yang-Ming University Hospital, Yilan, Taiwan; fDepartment of Pharmacy, National Yang-Ming University Hospital, Yilan, Taiwan; gDepartment of Nursing, National Yang-Ming University Hospital, Yilan, Taiwan; hDepartment of Medical Science, National Yang-Ming University Hospital, Yilan, Taiwan; iDepartment of Surgery, National Yang-Ming University Hospital, Yilan, Taiwan

Purpose: Infection by drug-resistant bacteria complicates patient treatment, threatens patient safety, and increases medical expenses. Among the drug-resistant bacteria, carbapenem-resistant Acinetobacter baumannii (CRAB) has been increasingly recognized in hospitals of Taiwan. A growing body of evidence suggests that implementation of antimicrobial stewardship programs (ASPs) is effective in reducing both inappropriate antimicrobial use and, subsequently, the rate of drug-resistant bacteria. In a university hospital in northeastern Taiwan, a multidisciplinary ASP was implemented with the aim of reducing the consumption of carbapenems and the rate of CRAB.

Methods: The ASP includes several components. First, a computerized hospital-wide surveillance system was established to facilitate infection control measures of drug-resistant bacteria. Using a computerized antimicrobial approval system, the appropriateness of carbapenem prescription was reviewed by the infectious disease physician. In units with high prevalence, active surveillance screening culture for CRAB was done upon admission. Finally, a quality-improvement activity was introduced to improve the quality of environmental cleaning in the hospital.

Results: The rate of CRAB reached its highest in January 2014, exceeding 70.83%. After implementation of the ASP, there was a gradual and steady decrease in the rate of CRAB, falling below 30% in July 2014. Compared with its highest, the rate of CRAB decreased 41.2% within 6 months of the ASP. (Figure 1)

Conclusions: A coordinated multidisciplinary ASP is effective in reducing the rate of CRAB in the hospital. The effect is obvious since the early phase of intervention.

EMERGENCE OF OXA-48 CARBAPENEMASE IN TAIWAN

Ling Ma a, Peijing Chen c, Fumie Lin c, Yijun Ding c, Liyue Huang a, Jenchang Chang c, Qihong Liu c, Yukuo Tai c, Poliang Lu a. aNational Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Zhunan, Taiwan; bNational Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Zhunan, Taiwan; cNational Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Zhunan, Taiwan

Purpose: OXA-48 producing Enterobacteriaceae are increased dramatically in Mediterranean countries in the past ten years. It has been found in Asia recently. Here, we report the emergence of OXA-48 during a nationwide survey in Taiwan.

Methods: A 4 year carbapenem resistant Enterobacteriaceae surveillance program was conducted from 2012. From 2012 to May 2014, we obtained 760 carbapenem non-susceptible K. pneumoniae (CnSKP) and 144 carbapenem non-susceptible E. coli (CnSEC) isolates till April 2014. Antibiotics susceptibility test, detection of carbapenemase, ESBLs and AmpC, outer membrane porin (omp) profiles and genetic relationship with PFGE and MLST were performed.

Results: Four OXA-48 producing K.pneumoniae were detected after 28 month screening. The OXA-48 gene is encoded by a conjugal plasmid and associated with IS1999. The upstream of blaOXA-48 identical to pKoxa-48N1, four plasmids showed similar digestion profiles, the plasmid size was predicted over 62kb. Three isolates co-produced CTX-M enzyme and belong to ST11, their plasmid belong to Inc A/C. Four isolates belong to three different clones.

Conclusions: It is the second report of OXA-48 on IncA/C plasmid in K.pneumoniae. The association OXA-48 and CTX-M lead to pan-resistance. Taking into account the pandemic clone of ST11 K.pneumoniae and incorporation of Inc A/C plasmid, the rapid dissemination of ST11 OXA-48 combined with CTX-M ESBL is of great concern.